

DOCUMENT RESUME

ED 157 355

EC 111 872

AUTHOR Rondal, J. A.
TITLE Recent Advances in the Study of Pre- and Early Linguistic Development Open New Perspectives for Early Language Intervention in Severely and Moderately Mentally Retarded Children.
PUB DATE Jun 78
NOTE 26p.; Paper presented at the World Congress on Future Special Education (First, Stirling, Scotland, June 25 - July 1, 1978)
EDRS PRICE MF-\$0.83 HC-\$2.06 Plus Postage.
DESCRIPTORS Communication Skills; *Early Childhood Education; *Intervention; *Language Development; *Mentally Handicapped

ABSTRACT

The paper reviews research on and techniques for early linguistic intervention with retarded children. Outlined are principles upon which linguistic intervention should be based, a definition of early intervention, the rationale for early language and communication intervention, and principles for developmental prelinguistic and early linguistic intervention. Techniques are described for enhancing vocal communication, proto-conversation, and reference; facilitating object concept development and promoting representational mental activity and symbolic play before teaching receptive and expressive vocabulary; and facilitating combinatorial speech. (SEB)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED157355

214 #6

C.E.C. - STIRLING
1978

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY.

RECENT ADVANCES IN THE STUDY OF PRE- AND EARLY
LINGUISTIC DEVELOPMENT OPEN NEW PERSPECTIVES
FOR EARLY LANGUAGE INTERVENTION IN SEVERELY AND
MODERATELY MENTALLY RETARDED CHILDREN¹

J.A. RONDAL Ph.D.²

A. Rondal
Associate Professor of Education
Office 1326
Faculty of Education
Laval University
Quebec
P.Z. Canada G1K 7P4

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

C.E.C.

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC) AND
USERS OF THE ERIC SYSTEM."



EC111872

1. THE BASES OF LINGUISTIC INTERVENTION WITH RETARDED CHILDREN

LINGUISTIC INTERVENTION WITH RETARDED CHILDREN SHOULD BE BASED ON THE FOLLOWING PRINCIPLES:

- A - START EARLY AND CONTINUE THROUGHOUT THE YEARS.
- B - INVOLVE THE CHILD'S FAMILY.
- C - BE DEVELOPMENTAL IN NATURE, I.E., MAKE USE OF THE DATA ON NORMAL LANGUAGE DEVELOPMENT.

AS TO PRINCIPLE A, THERE IS A CONSENSUS AMONG PARENTS AND PROFESSIONALS THAT EARLY INTERVENTION IS LIKELY TO BE MORE SUCCESSFUL THAN LATER INTERVENTION. I WILL CARRY THIS ASSUMPTION A STEP FURTHER TOWARD SO-CALLED "VERY EARLY INTERVENTION" IN THIS PRESENTATION. THE BELIEF IN THE VIRTUES OF EARLY INTERVENTION IS SHARED BY A GREAT NUMBER CHILD PSYCHOLOGIST AND BY MANY EDUCATORS. MUCH ALONG THE SAME LINE, THE PEOPLE ASSOCIATED WITH THE "HEAD START" MOVEMENT FOR PREVENTING INTELLECTUAL DEFICITS IN LOWER-CLASS CHILDREN IN THE UNITED STATES HAVE RECOMMENDED THAT FUTURE COMPENSATORY EDUCATION BE STARTED IN INFANCY AND CONTINUED THROUGHOUT THE SCHOOL YEARS (E.G., HUNT, 1969;SCHAEFFER, 1970).

AS TO PRINCIPLE B, IT HAS BECOME CLEAR THAT THE CHILDREN'S FAMILIES SHOULD BE INVOLVED FROM THE START IN THE INTERVENTION PROCESS. RESULTS ARE BETTER INDEED AND GENERALIZATION FROM TRAINING TO REAL LIFE SITUATIONS EASIER WHEN THE PARENTS, AND PARTICULARLY THE MOTHER, ACTIVELY PARTICIPATE IN THE TRAINING (E.G., MAHONEY, 1975;MACDONALD AND COLLABORATORS, 1974).

ALSO, LANGUAGE INTERVENTION WITH MENTALLY RETARDED CHILDREN SHOULD BE DEVELOPMENTAL (YODER AND MILLER, 1972). INDEED, THERE IS ENOUGH CORRESPONDENCE BETWEEN LANGUAGE DEVELOPMENT IN RETARDED AND NONRETARDED CHILDREN TO JUSTIFY USING THE DATA ON NORMAL LANGUAGE ACQUISITION IN PROGRAMMING LINGUISTIC INTERVENTION. IN OTHER WORDS, AS RETARDED CHILDREN SEEM TO ACQUIRE LANGUAGE MUCH IN THE SAME WAY AS NORMAL CHILDREN, THE DATA ON NORMAL DEVELOPMENT MAY BE TAKEN AS A MAP OF DEVELOPMENT. THE SPEECH BEHAVIOR OF ANY RETARDED CHILD CAN BE LOCATED ON THAT MAP AND SLIGHTLY MORE COMPLEX BEHAVIOR TAUGHT STEP BY STEP. DR. TOOMEY'S CONTRIBUTION TO THIS SEMINAR IS RELATED, AT LEAST PARTIALLY, TO THE SAME POINT, I.E. THE ISSUE OF TAKING DATA AND SCHEDULES OF NORMAL DEVELOPMENT AS BASELINES FOR PROGRAMMING COGNITIVE AND LINGUISTIC INTERVENTION.

2. HOW EARLY DO WE MEAN INTERVENTION?

ALTHOUGH THERE IS AGREEMENT REGARDING THE NECESSITY OF INITIATING LANGUAGE TRAINING EARLY IN THE LIFE OF THE RETARDED CHILD, NO PRECISE DEFINITION OF "EARLY" HAS BEEN PROPOSED. DEPENDING ON THE PROGRAMS, "EARLY" MAY MEAN FROM TWO TO FIVE OR SIX YEARS AT THE ONSET OF THE INTERVENTION. IT IS OUR READING OF THE CURRENT SPECIALIZED LITERATURE THAT THE KNOWLEDGE AND TECHNOLOGY PRESENTLY EXIST TO INITIATE VERY EARLY PRELINGUISTIC AND LINGUISTIC INTERVENTION WITH RETARDED CHILDREN. BY "VERY EARLY INTERVENTION", I MEAN SYSTEMATIC INTERVENTION FROM THE FIRST MONTHS OF LIFE ON. I CONTEND THAT ONLY THROUGH VERY EARLY COMMUNICATION AND LANGUAGE INTERVENTION PROCEDURES DOES ONE HAVE

THE BEST CHANCES TO MINIMIZE THE IMPRESSIVE DELAYS THAT CHARACTERIZE THE LANGUAGE DEVELOPMENT OF RETARDED CHILDREN.

3. WHAT IS THE RATIONALE FOR A VERY EARLY LANGUAGE AND COMMUNICATION INTERVENTION?

THE RATIONALE DIRECTLY COMES FROM THE RECENT RECOGNITION OF THE IMPORTANCE OF THE FIRST YEAR (AND MORE BROADLY OF THE FIRST TWO YEARS) FOR LANGUAGE DEVELOPMENT IN NORMAL CHILDREN.

SOME OF THE MAIN DATA IN THIS RESPECT ARE THE FOLLOWING:

A.- THE CAPACITY FOR FINE SOUND DISCRIMINATION AND EARLY CATEGORICAL PERCEPTION OF SPEECH SOUNDS IN THE YOUNG INFANT (E.G., THE CAPACITY TO DISCRIMINATE BETWEEN VOICELESS AND VOICED STOP CONSONANTS LIKE P AND B AT ONE MONTH OF AGE; EIMAS AND COLLABORATORS, 1971). IN OTHER WORDS, THE RECEPTIVE CAPABILITIES OF THE INFANT MAY BE QUITE POWERFUL RIGHT FROM THE START.

B.- THE PROGRESSIVE STRUCTURATION OF EARLY VISUAL, VOCAL, AND GESTURAL INTERACTION BETWEEN INFANT AND MOTHER (OR CARETAKER) INTO "CONVERSATION-LIKE" EXCHANGES, I.E., WITH NEAR-CONSTANT COMMUNICATION IN ONE MODALITY (VISUAL) AND INTERMITTENT, ALTERNATING, AND RECIPROCAL COMMUNICATION COMMUNICATION IN ANOTHER (VOCAL, GESTURAL), FOR EXAMPLE, MOTHER AND INFANT GAZING CONTINUOUSLY AT EACH OTHER WHILE THEY EXCHANGE VOCALIZATIONS (E.G., BATESON, 1975). IN OTHER WORDS, THE FUNDAMENTAL STRUCTURE OF LATER CONVERSATION IS ESTABLISHED DURING THE FIRST YEAR.

C.- THE DISCOVERY OF PRELINGUISTIC AND COGNITIVE PREREQUISITES OF SPEECH LIKE, IN JEROME BRUNER'S TERMS (1975), MEANS-END ANTICIPATION OR THE IDEA THAT SOME MEANS CAN BE USED TO REACH PARTICULAR ENDS, LIKE TRANSACTION OR THE IDEA THAT OTHERS MAY BE USED AS INSTRUMENTS TO ACHIEVE ONE'S GOALS, LIKE COMMUNICATIVENESS OR THE ENORMOUS "APPETITE" OF THE INFANT FOR SOCIAL INTERACTION - THIS APPETITE IS WELL SUPPORTED BY ADULT RECIPROCATION -, AND LIKE TASK-SYSTEMATICITY OR THE ACHIEVEMENT OF EARLY MASTERY IN OFTEN REPEATED TASKS (HOLDING AND RELEASING OBJECTS, BANGING THINGS, THROWING, REPEATING SOUNDS AND SOUND COMBINATIONS, ETC.). THE POINT HERE IS THAT THESE FUNCTIONS ARE FULFILLED BY PRELINGUISTIC COMMUNICATIVE MEANS BEFORE ANY LINGUISTIC ACQUISITION TAKES PLACE. IN OTHER WORDS, LANGUAGE DOES NOT SIMPLY "GROW OUT" BABBLING AND PROTO-WORDS. IT RESTS UPON PRIOR MASTERY OF REQUIREMENTS AND OBJECTIVES THAT ARE FIRST PUT INTO PLACE DURING THE FIRST YEAR.

D.- THE REALIZATION OF THE EXISTING RELATIONSHIPS BETWEEN BABBLING AND FURTHER PHONOLOGICAL DEVELOPMENT (E.G., OLLER AND COLLABORATORS, 1974). BABBLING AS IT NOW SEEMS EXHIBITS MANY OF THE SAME PREFERENCES FOR CERTAIN SOUNDS AND SEQUENCES OF SOUNDS FOUND IN MEANINGFUL SPEECH AT LATER STAGES OF LANGUAGE DEVELOPMENT. FOR EXAMPLE, SINGLETON CONSONANTS ARE ABOUT NINE TIME MORE FREQUENT THAN CONSONANT CLUSTERS IN BABBLING AS THEY ARE IN CHILDREN'S MEANINGFUL SPEECH. INITIAL CONSONANTS OUTNUMBER FINALS IN INFANT BABBLING JUST LIKE INITIAL CONSONANT DELETION IS RELATIVELY RARE AS OPPOSED TO FINAL CONSONANT DELETION IN

CHILDREN'S SPEECH. IN THE SAME WAY, INITIAL STOP CONSONANTS (P, T, K, B, D, G,) OUTNUMBER FRICATIVES AND AFFRICATES (F, V, TCH LIKE IN SCOTCH AND IN MATCH, DJ LIKE IN GIN OR IN JAZZ, TS, LIKE IN STAR OR IN TSETSE - THE AFRICAN FLY -) IN BABBLING JUST LIKE INITIAL STOPS TEND TO BE SUBSTITUTED FOR FRICATIVES AND AFFRICATES IN CHILDREN'S SPEECH (FOR EXAMPLE TISH FOR FISH, HOT TUDGE FOR HOT FUDGE, TOCOLATE FOR CHOCOLATE). WHAT THOSE DATA MEAN IS THAT BABBLING BEAR DIRECT RELATIONSHIPS TO THE SOUNDS OF LATER MEANINGFUL SPEECH. BABBLING THEREFORE IS TO BE TAKEN SERIOUSLY FROM A LINGUISTIC POINT OF VIEW. IT RATHER DIRECTLY SETS THE GROUND FOR FUTURE PHONOLOGICAL DEVELOPMENT.

E.- INFANT SPEECH AND CHILD LANGUAGE MUST BE CONSIDERED WITHIN THE FRAMEWORK OF THE CHILD'S COGNITIVE DEVELOPMENT. PIAGET'S SENSORI-MOTOR PERIOD OF INTELLECTUAL DEVELOPMENT IS CONSIDERED TO BE HIGHLY RELEVANT FOR EARLY LANGUAGE ACQUISITION. THIS PERIOD COVERS THE FIRST TWO YEARS AND IS CURRENTLY RECEIVING MUCH ATTENTION. THE KNOWLEDGE ACCUMULATED BY THE NORMAL CHILD DURING THE FIRST TWO YEARS ON THE PHYSICAL AND SOCIAL ENVIRONMENT SURROUNDING HIM OR HER IS TREMENDOUS. ONE OF THE FOREMOST ACCOMPLISHMENT IN THIS RESPECT IS THE REALIZATION THAT THE SOCIAL AND THE PHYSICAL OBJECTS HAVE PERMANENCE AND CAN BE REPRESENTED EITHER MENTALLY OR USING SYMBOLS. THE ATTAINMENT OF THE CONCEPT OF OBJECT PERMANENCE AND THE ONSET OF REPRESENTATION (E.G., PIAGET, 1954) SEEM TO BE TWO OF THE PREREQUISITES FOR LEXICAL AND EARLY COMBINATORIAL SPEECH DEVELOPMENT. IN OTHER WORDS, KNOWING THAT PERSONS AND THINGS HAVE PERMANENT OR QUASIPERMANENT STATUS AND CAN BE REPRESENTED IS NECESSARY FOR SPEECH PRODUCTION. PERSONS AND THINGS NOT ONLY EXIST PERMANENTLY, SO-TO-SPEAK, THEY ALSO

RELATE TO EACH OTHER IN VARIOUS WAYS. PERSONS AND THINGS ARE LOCATED IN CERTAIN PLACES. PERSONS POSSESS THINGS, USE THINGS AS INSTRUMENTS, GIVE THINGS TO OTHER PERSONS WHO BENEFIT FROM THE OPERATION. PERSONS EXPERIENCE STATES AND PERFORM ACTIONS ON THINGS, AND SO ON. THIS RELATIONAL NETWORK IS DIRECTLY EMBODIED IN THE TWO- AND MULTIWORD COMBINATIONS PRODUCED BY MOST NORMALLY DEVELOPPING CHILDREN AROUND 24 MONTHS. IT CONSTITUTES ANOTHER AND MOST IMPORTANT COGNITIVE PREREQUISITE FOR THE APPEARANCE AND THE DEVELOPMENT OF MULTIWORD UTTERANCES (E.G. EDWARDS, 1973). IN OTHER WORDS, KNOWING ABOUT THE RELATIONSHIPS BETWEEN PERSONS AND BETWEEN PERSONS AND THINGS IS NECESSARY FOR COMBINATORIAL SPEECH PRODUCTION.

GIVEN THE ABOVE INFORMATION, INTERVENTION COULD TARGET ON THE RETARDED INFANT AND IN SO DOING GET TO THE ROOTS OF THE LANGUAGE PROBLEM.

4. A FEW PRINCIPES FOR DEVELOPMENTAL PRELINGUISTIC AND EARLY LINGUISTIC INTERVENTION.

NO SUCH PROGRAM IS OPERATIONAL TO DATE. MY PRESENTATION THEREFORE IS ENTERELY SPECULATIVE. IT KEEPS UP WITH THE GENERAL THEME OF THE CONGRESS, A PROJECTION OVER THE FUTURE OF SPECIAL EDUCATION.

HOW SHOULD A PRELINGUISTIC AND EARLY LINGUISTIC INTERVENTION PROGRAM PROCEED? I SEE FOUR BASIC SPEPS.

- STEP ONE: COLLECT DATA AND DEVELOP THE DATA BANK ON PRELINGUISTIC AND EARLY LINGUISTIC DEVELOPMENT IN NORMAL INFANTS.
 - STEP TWO: COLLECT CORRESPONDING DATA FOR THE RETARDED INFANTS AND CHILDREN. THIS RAISES THE QUESTION OF THE VERY EARLY IDENTIFICATION OF THE RETARDED CHILD. THE DOWN'S SYNDROME INFANT CAN BE READILY IDENTIFIED AT BIRTH. ACCORDINGLY, THIS CATEGORY OF INFANTS AND CHILDREN HAS BEEN MUCH STUDIED. TECHNIQUES ARE BEING DEVELOPPED, HOWEVER, TO IMPROVE EARLY IDENTIFICATION OF OTHER CATEGORIES OF SEVERELY AND PROFOUNDLY RETARDED INFANTS.
 - STEP THREE: SYSTEMATICALLY COMPARE PRELINGUISTIC AND EARLY LINGUISTIC DEVELOPMENT OF NORMAL AND RETARDED INFANTS. IN SO DOING, DETECT WHEN, FOR WHICH SPEECH COMPONENT, AND IN WHICH RESPECT THE DEVELOPMENT OF RETARDED CHILDREN BEGINS TO DIFFER FROM THE ONE OF NORMAL CHILDREN.
 - STEP FOUR: USE THIS INFORMATION TO DEVISE HARD-NOSED INTERVENTIVE ATTACKS ON THE ON GOING DEFICITS EXHIBITED BY THE RETARDED CHILDREN RIGHT FROM THE TIME OF THEIR APPEARANCE.
5. WHAT DO WE KNOW ABOUT THE NATURE AND TIMING OF EARLY DEFICITS IN THE SPEECH DEVELOPMENT OF RETARDED CHILDREN AND GIVEN WE KNOW SOMETHING WHAT CAN WE DO ABOUT IT?

OUR KNOWLEDGE OF THE NATURE AND TIMING OF EARLY DEFICITS IN THE SPEECH OF RETARDED CHILDREN IS SLOWLY EXPANDING. HOWEVER, THE BLACK AREAS, SO-TO-SPEAK, BY FAR OUT NUMBER THE CLEARING AREAS, I.E. THOSE DOMAINS FOR WHICH GOOD DATA EXIST.

WHAT CAN BE DONE ABOUT THE DEFICITS WHOSE NATURE AND TIMING ARE KNOWN IS STILL A MATTER OF PERSONAL OPINION AS NOTHING HAS BEEN TRIED YET. THIS STATE OF AFFAIRS SHOULD NOT DISCOURAGE US FROM TRYING TO MOVE AHEAD AS INTUITION AND SPECULATION NECESSARILY PRECEDE ANY CONCRETE MOVE.

5 A. THINGS WE KNOW.

1. BABBLING AND VOCAL COMMUNICATION

WE KNOW (I.E. SMITH, 1977) THAT THE "PHONOLOGICAL" ASPECTS OF BABBLING (THE TYPES OF SOUNDS THAT ARE HEARD IN BABBLING) ARE QUITE SIMILAR IN THE NORMAL AND THE DOWN'S SYNDROME CHILDREN. THE SAME DEVELOPMENTAL SEQUENCES AND THE SAME TIMING ARE OBSERVED IN THE TWO POPULATIONS OF CHILDREN FOR THE APPEARANCE OF THE VARIOUS VOWELS AND CONSONANTS.

(FRONT AND CENTRAL VOWELS LIKE I, E, AND AE APPEAR FIRST, THEN BACK VOWELS LIKE A, O, U. FOR THE CONSONANTS, UP TO ABOUT SIX MONTHS, VELAR SOUNDS LIKE K AND G TEND TO DOMINATE. THEN THE VELARS DECREASE IN FREQUENCY AND ALVEOLAR SOUNDS LIKE T, D, AND N BECOME DOMINANT. LABIAL CONSONANTS LIKE P, B, AND M REMAIN INTERMEDIATE IN FREQUENCY THROUGHOUT THE FIRST YEAR.)

"REDUPLICATED BABBLING", I.E., REPETITION OF A CONSONANT-VOWEL SYLLABLE A NUMBER OF TIMES IN SUCCESSION LIKE IN "MAMAMAMAMA" OR "TATATATATA" BEGINS AROUND 8 MONTHS IN NORMAL INFANTS. THE DATA COLLECTED BY SMITH (1977) INDICATE THAT THE SAME IS TRUE FOR DOWN'S SYNDROME INFANTS.

WE ALSO KNOW (JONES, 1977) THAT THE RELATIONAL PATTERNS OF MOTHER-CHILD PRE-LINGUISTIC COMMUNICATION IN NORMAL AND IN DOWN'S SYNDROME CHILDREN DIFFER NOTICEABLY AS SOON AS THE INFANTS ARE 8-MONTH OLD EVEN WHEN GENERAL FREQUENCY COUNTS DO NOT SHOW DIFFERENCES. FOR EXAMPLE, THE AVERAGE RATE OF INTERACTIONAL EXCHANGES (VOCAL AND NONVOCAL) PER MINUTE FOR EACH MOTHER-CHILD PAIR IS ABOUT THE SAME FOR NORMAL AND DOWN'S SYNDROME CHILDREN BETWEEN 8 AND 18 MONTHS (THE UPPER LIMIT IN JONES' STUDY). IN THE SAME WAY, THE GENERAL INCIDENCE EYE-TO-EYE CONTACT IN MOTHER-CHILD PAIRS IS NOT DIFFERENT BETWEEN THE NORMAL AND THE DOWN'S SYNDROME CHILDREN. HOWEVER, SO-CALLED "REFERENTIAL LOOK" OR "JOINT ATTENTION" FROM THE PART OF THE MOTHER AND THE CHILD IS MORE FREQUENT IN THE NORMAL CHILDREN. HERE IS AN EXAMPLE OF REFERENTIAL LOOK: THE CHILD BANGS A DRUM, LOOKS AT THE MOTHER PAUSING IN ACTIVITY, MOTHER NODS, SMILES AND SAYS "YOU BANGET IT, DIDN'T YOU?", CHILD CONTINUES BANGING DRUM.

IT IS LIKELY THAT JOINT ATTENTION FROM THE CHILD'S AND MOTHER'S PART IS NECESSARY FOR SEMANTIC DEVELOPMENT. FOR EXAMPLE IN THE EXAMPLE JUST GIVEN, THE MOTHER USES THE ITEM "YOU BANGED IT" WITH REFERENCE TO THE IMMEDIATELY PRECEDING ACTION OF THE CHILD. EPISODES OF THIS KIND ARE PROBABLY NECESSARY FOR LEARNING THE RELATIONSHIP BETWEEN SAY CERTAIN ACTIONS (LIKE BANGING) AND SPECIFIC SOUND COMBINATIONS (LIKE "B-A-NG(-E-D)). DOWN'S SYNDROME CHILDREN UNLIKE NORMAL CHILDREN AGED 8 MONTHS AND MORE TEND TO VOCALIZE EITHER IN LONG CONTINUOUS STRINGS OR REPEATING VOCALIZATION ON TOP OF EACH OTHER WITH LESS THAN 1/2 SECOND LEFT FOR DIALOGUE. THOSE PATTERNS OF VOCALIZATIONS SHOW

LAPSES OF INTERACTIVE TURN-TAKING SKILLS IN DOWN'S SYNDROME CHILDREN. THIS LACK OF SKILL MAKES UP FOR THE HIGH FREQUENCY OF "VOCAL CLASHES" BETWEEN DOWN'S SYNDROME CHILDREN AND THEIR MOTHERS AS OPPOSED TO NORMAL CHILDREN OF CORRESPONDING AGES. IT ALSO MAKES IT DIFFICULT, FOR THE MOTHERS OF DOWN'S SYNDROME CHILDREN TO "PICK UP" THE VOCALIZATION OF THEIR CHILD AND EXPAND IT.

2. ENCODING MEANING

AS IT IS KNOWN, VOCABULARY DEVELOPMENT IS MARKEDLY DELAYED AND INCOMPLETE IN MENTALLY RETARDED CHILDREN. SMITH (1977) HAS REPORTED THAT THE ONSET OF MEANINGFUL SPEECH (ONE-WORD UTTERANCES) IS DELAYED BY ROUGHLY 7 OR 8 MONTHS IN DOWN'S SYNDROME CHILDREN WHEN COMPARED TO NORMALS. AT APPROXIMATIVELY 14 MONTHS, ABOUT 15% OF THE UTTERANCES OF THE NORMAL CHILDREN ARE MEANINGFUL PRODUCTIONS. FOR THE DOWN'S SYNDROME INFANTS, THE AVERAGE AGE BY WHICH MEANINGFUL SPEECH APPEARS IS APPROXIMATIVELY 24 MONTHS OF AGE. IN ADDITION, AT THIS TIME, THE AMOUNT OF MEANINGFUL SPEECH EXISTING FOR THE DOWN'S SYNDROME CHILDREN IS LOWER THAN 5%. FURTHERMORE IN CONTRAST WITH THE RELATIVELY RAPID LINGUISTIC DEVELOPMENT IN NORMAL CHILDREN AFTER THE FIRST WORDS HAVE APPEARED, ONLY A VERY SLIGHT INCREASE IN MEANINGFUL SPEECH IS OBSERVED ACROSS MORE THAN A YEAR'S TIME SPAN FOR THE DOWN'S SYNDROME INFANTS.

THE TIMING OF EARLY MEANINGFUL SPEECH DEVELOPMENT APPEARS THEREFORE TO BE DRAMATICALLY ALTERED IN DOWN'S SYNDROME INFANTS.

WHAT ABOUT THE NATURE OF THIS DEVELOPMENT,
WE KNOW THAT EARLY MEANINGFUL EXPRESSIVE SPEECH IS LINKED TO THE
DEVELOPMENT OF OBJECT CONCEPT AND REPRESENTATION IN THE NORMAL
CHILD. ON THAT BASIS, WE WOULD EXPECT THOSE RETARDED CHILDREN
 WHO FAIL TO EXHIBIT MEANINGFUL EXPRESSIVE SPEECH TO BE DELAYED
 AS TO OBJECT CONCEPT DEVELOPMENT. THIS IS INDEED WHAT KAHN(1975)
 AND DALE (1977) HAVE OBSERVED WITH SEVERELY AND PROFOUNDLY
 RETARDATEES, DOWN'S SYNDROME AND OTHERS.

THEREFORE, INTERVENTION WITH REGARDED CHILDREN
 SHOULD FOCUS ON OBJECT CONCEPT AND ON THE ONSET OF REPRESENTATION
 IN AN ATTEMPT TO FACILITATE AND TO ENHANCE MEANINGFUL SPEECH
 PRODUCTION.

3. RELATIONAL MEANING AND COMBINATORIAL SPEECH

IT IS USUALLY NOT BEFORE 4 YEARS OF AGE THAT SEVERELY
 AND MODERATELY RETARDED CHILDREN BEGIN TO COMBINE TWO WORDS IN THE
 SAME UTTERANCE. WHEN THEY DO SO, THEY SEEM TO MAKE USE OF THE
SAME RANGE OF RELATIONAL MEANINGS AS THOSE UNDERLYING THE TWO-
WORD UTTERANCES OF YOUNGER NORMAL CHILDREN (BUTUM, RYNDERS, &
 TURNURE, 1974; RONDAL, 1978).

EXAMPLES OF SEMANTIC RELATIONS EXPRESSED ARE: NOTICE OR
 EXISTENCE ("THAT (A) CAR") ("HIMOMMY"), DISAPPEARANCE ("MILK
 ALLGONE"), RECURRENCE ("MORE MILK"), ATTRIBUTION ("COFFEE HOT"),
POSSESSION ("MY BALLOON"), LOCATION ("MILK IN"), AGENT-ACTION
 ("BABY-EAT"), ACTION-PATIENT ("WASH CUP"). THREE-WORD UTTERANCES

ARE FORMED LATER BY EXPANDING AND RECOMBINING TWO-WORD UTTERANCES LIKE IN "MY DOGGIE PEEPEE". (AGENT-ACTION TOGETHER WITH AN INDICATIONS OF POSSESSION PLACED ON THE AGENT).

THE TWO PREREQUISITES FOR PRODUCTION OF TWO-WORD UTTERANCES SEEM TO BE:

- (1) SOME SORT OF ORGANIZED BASIC KNOWLEDGE ON THE WAYS PERSONS AND PERSONS, AND PERSONS AND THINGS RELATE.
- (2) SOME CAPACITY FOR COMBINING UNITS SEQUENTIALLY.

WHAT ABOUT THE WORD ORDER PATTERNS OBSERVED IN THE EARLY COMBINATORIAL SPEECH OF NORMAL CHILDREN? THE WAY NORMAL CHILDREN PROCEED AT FIRST WHEN COMBINING TWO WORDS IN THE SAME UTTERANCE IS BY USING A SMALL NUMBER OF WORDS OCCURRING IN A FIXED POSITION (THE FIRST OR THE SECOND POSITION IN THE UTTERANCE) AND COMPLETING THE UTTERANCE WITH ONE OF A LARGER SET OF OTHER WORDS. THE FORMER (FIXED POSITION WORDS) ARE TECHNICALLY NAMED PIVOTS AND THE LATTER(FREE POSITION WORDS) OPEN WORDS. EXAMPLES OF PIVOT-OPEN AND OPEN-VIVOT CONSTRUCTIONS ARE GIVEN IN TABLE I.

THIS INFORMATION ON EARLY WORD COMBINATIONS IN NORMAL CHILDREN SHOULD BE GIVEN GREAT CONSIDERATION WHEN IT COMES TO FACILITATING EARLY COMBINATORIAL SPEECH IN RETARDED CHILDREN.

TABLE I *

WASH CUP (ACTION-PATIENT)

WASH DOGGIE

WASH HANDS

WASH BABY

HI DOG (NOTICE OR EXISTENCE)

HI MOMMY

HI BALL

HI BABY

LIGHT ON

SHOE ON

HAT ON

DRESS ON
MORE MILK (RECURRENCE)

MORE MOMMY

MORE DOG

ALLGONE BABY (DISAPPEARANCE)

ALLGONE MILK

ALLGONE COOKIE

ALLGONE DOG

ALLGONE MOMMY

BALL OFF (DISAPPEARANCE)

LIGHT OFF

DRESS OFF
MY BALLOON (POSSESSION)

MY MOMMY

MY DOG

MILK IN (LOCATION)

BABY IN

DOG IN

MOMMY IN

MILK DOWN

COFFEE HOT (ATtribution)

MOMMY HOT

CAR HOT

MILK HOT

* EXAMPLES OF PIVOT CONSTRUCTIONS (THE PIVOT WORD IN UNDERLINED)

5.B THINGS WE CAN DO.

THE FOLLOWING IS PROSPECTIVE AND ONLY CONCERNED WITH THE BASIC PRINCIPLES OF THE ACTIONS THAT COULD AND SHOULD BE UNDERTAKEN. OF COURSE NO DETAILED PROGRAM CAN BE WORKED OUT BEFORE PRELIMINARY CONCRETE ACTION HAS BEEN TRIED. ALSO THE THINGS SUGGESTED IN THE FOLLOWING ARE BUT A FEW AMONG MANY POSSIBLE THINGS THAT COULD BE IMAGINED AND TRIED.

1. ENHANCING VOCAL COMMUNICATION, PROTO-CONVERSATION, AND REFERENCE.

AS IT SEEMS FROM THE DATA AVAILABLE, THERE IS NO NEED TO MODIFY BABBLING PER SE IN THE DOWN'S SYNDROME INFANTS AS THE AMOUNT, TIMING, AND PHONOLOGICAL CHARACTERISTICS OF BABBLING ARE SIMILAR IN DOWN'S SYNDROME AND IN NORMAL INFANTS.

THE EMPHASIS IN THE INTERVENTION SHOULD BE PLACED ON THOSE COMMUNICATIVE, PROTO-CONVERSATIONAL, AND REFERENTIAL ASPECTS OF THE INTERACTION LIKE INCREASING AND MAINTAINING A HIGH PROPORTION OF VOCALIZATION DIRECTED TOWARD THE SOCIUS AND LEARNING TURN-TAKING SKILLS AND JOINT ATTENTION OR REFERENTIAL LOOK.

THE OPERANT TECHNIQUES APPEAR TO BE MOST APPROPRIATE FOR SHAPING THE DESIRED BEHAVIORS IN THE THREE CASES. WIEGERINK AND HIS COLLABORATORS (WIEGERINK, HARRIS, SIMEONSSON, AND PEARSON, 1974) HAVE REPORTED SUCCESS IN CONTROLLING SOCIALLY DIRECTED VOCALIZATION

IN DELAYED INFANTS AGED 11 - 22 MONTHS USING AN OPERANT TECHNIQUE. THE INTERVENTION TOOK PLACE AT HOME. EACH INFANT PARTICIPATED IN 2 10-MINUTE SESSIONS DAILY FOR APPROXIMATIVELY ONE MONTH. THE REINFORCING AGENT WAS EITHER A FAMILIAR ADULT OR A NOVEL ADULT (THE EXPERIMENTER). THE REINFORCEMENT PROVIDED CONTINGENT UPON VOCALIZATION WAS SOCIAL. IT CONSISTED IN THE FORM OF A SMILE, UTTERANCES LIKE "GOOD BOY" OR "GOOD GIRL" OR "GOOD" PLUS THE NAME OF THE CHILD, AND LIGHT TOUCH ON THE INFANT'S CHIN OR ABDOMEN WHEN FEASIBLE. THE RESULTS INDICATED THAT THE VOCALIZATIONS WERE UNDER CONTROL, I.E., COULD BE MADE MORE OR LESS FREQUENT, AND THAT FAMILIAR AND NOVEL AGENTS WERE EQUALLY EFFECTIVE AS REINFORCING AGENTS.

WIEGERINK'S TECHNIQUE CAN PROBABLY BE APPLIED WITHOUT MODIFICATION TO YOUNGER INFANTS. IT WOULD HELP CONTROLLING SOCIALLY DIRECTED VOCALIZATIONS AND SET THE GROUND FOR FURTHER INTERVENTION.

THEN A SIMILAR TECHNIQUE COULD BE USED FOR TEACHING TURN-TAKING SKILLS AND REFERENTIAL LOOK TO THE RETARDED INFANTS. FOR TURN-TAKING, IT WOULD BE APPROPRIATE TO START IN REINFORCING NON-VOCAL TURN-TAKING BEHAVIORS. A NON-VOCAL TURN-TAKING BEHAVIOR WOULD BE ANY ACTION PERFORMED BY THE CHILD CONTINGENT UPON AN ACTION OR A VOCALIZATION OF THE ADULT. ONCE NON-VOCAL TURN-TAKING HAS BEEN ACQUIRED, ONE WOULD MOVE TOWARD BUILDING UP TURN-TAKING VOCALIZATIONS. NEEDLESS TO SAY THAT THE ADULT WOULD ALSO BE RESPONSIBLE FOR TAKING TURNS VOCALLY AND VERBALLY WITH THE INFANT, I.E., FOR FOLLOWING ON THE INFANT'S BEHAVIORS WITH APPROPRIATE VOCALIZATIONS AND VERBALIZA-

tions. An operant technique seems also well-suited to teaching joint attention in gradual steps starting with joint action (imposed on the infant at first).

2. FACILITATING OBJECT CONCEPT DEVELOPMENT AND PROMOTING REPRESENTATIONAL MENTAL ACTIVITY AND SYMBOLIC PLAY BEFORE TEACHING RECEPTIVE AND EXPRESSIVE VOCABULARY.

Object concept development and onset of representational mental activity are linked to the extent that the final stage in object development according to Piaget (the infant can cope with invisible displacements of an object) implies some sort of mental imagery. Training toward complete mastery of the object concept therefore offers some guarantee of enhancing representative ability as well.

Psychologists have traditionally associated symbolic play (for example, lying on a cushion and pretending to be asleep) with the onset of representation. Symbolic plays develops much at the same time as meaningful speech. This co-occurrence is no accident. The link between the word (as a sequence of sounds) and the object (or referent) is of the same nature (substitutive or symbolic - a symbol is something that stands for something else -) as the relationship between say the cushion and the bed in the example given above of symbolic play.

It is reasonable to see object concept development and early representational activity as prerequisites for vocabulary development. These specific dimensions of cognitive growth should therefore be trained before successful teaching of vocabulary can take place.

The stage properties of object concept development according to Piaget make this development well amenable, it seems to me, to some sort of programmed instruc-

tion. Symbolic play training could easily take place in interactive play sessions between parents and children using some sort of adaptation of the Wiegerink's approach, for example. As symbolic play probably stems from the same basic symbolic capacity as vocabulary development, promoting symbolic play in the infant could be assumed to have a facilitative effect on vocabulary development.

The ground would be prepared then for teaching receptive vocabulary. The technology for teaching receptive vocabulary to severely and moderately retarded children already exists. The Brickers (Bricker and Bricker, 1971), for example, have succeeded in increasing the number of functional words (i.e., words like "apple, milk, bus, socks, glass", etc., that have functional value for the retarded) understood by severely retarded children aged approximately ten years. They used a two-choice discrimination paradigm in which object name indicated the reinforced response. Interestingly, the Brickers have suggested that acoustic amplification of the word presented to the child (whose hearing is within normal limits) may produce improvement in vocabulary learning. Diane Bricker (1972) also succeeded in facilitating receptive vocabulary learning by teaching imitative sign-movements (for example, a chopping motion for the word "axe" and a pouring motion for the word "pitcher") to retarded children and having the children subsequently pairing the sign-movement with the appropriate word and with the appropriate object. The retarded children trained by the Brickers were approximately ten years old. I see no reason, however, why a similar technique could not be adapted for use with much younger children. The indication that associating sign-movement and word to object facilitates receptive vocabulary learning is important. It is much in the line of the suggestion by Rondal and Hoffmeister (1976) that at the early stages of communication and language development the severely and moderately retarded might greatly be-

nefit from the simultaneous learning of sign language (for example, American Sign Language) and oral language.

The final step is of course teaching expressive vocabulary. Once again the operant technique seems well-suited in this respect.

3. FACILITATING COMBINATORIAL SPEECH.

The task of facilitating early combinatorial speech can be divided in two sub-tasks : FIRST, make the child aware of the common relations between persons and between persons and things ; SECOND, train him or her to produce so-called pivot-constructions and later to expand those constructions into longer utterances.

As to sub-task one, i.e., sensibilizing the child to the basic relational properties of the physical and human environment, it seems clear that this could only be properly achieved through monitoring parent-child or caretaker-child interaction. Such interactive training sessions would take place at home in a directive-play context. The adult would systematically draw the child's attention to the common relational features of the objects and persons in the environment using verbal and non-verbal means. The activities would include: Pointing to familiar objects and naming them as well as their usual location and regular owner or user, sensibilizing the child to those properties and attributes of the things that he or she can best notice (and therefore encode) given the level of perceptual development attained - ^hotness, for example, is often among the first properties of things encoded by the normal infant; however, we need to know much more on the order in which normal and retarded children develop "conceptual sensitivity" to the attributes of the objects before being

able to properly caliber the content of the training sessions according to the developping capabilities of the child - making the child observe the effects of various kinds of actions performed on things (like making things fall down, banging objects, etc.) as well as the ways things can be used as instruments in order to reach certain goals or produce desired outcomes.

- As to sub-task two, i.e., combining words into patterned utterances, there are reports of successful attempts to facilitate pivot-like two-word constructions in severely and moderately retarded children aged 4 years (Jeffrey, Wheldall, and Mittler, 1973) and in younger speech delayed but otherwise normally developping children (Willbrand, 1977). The successful intervention, as it seems, has to proceed in the following way:

- Await until the child has a basis of approximatively twenty words which he uses meaningfully in spontaneous single word utterances.
- Rely on modeling (presenting pivot-constructions for the child to imitate) and expansion (expanding the single-word utterances spontaneously produced by the child into pivot-like two-word utterances- for example, if the child says "cookie", expand it into "see cookie") coupled with meaningful manipulations of the objects.
- Choose a small set of pivot-words to start with (see Table 1 above, for example) but be prepared to include any pivot-word chosen by the child.
- Use directive-play situations or any apparatus designed to provide concrete support for modeling (for example, any sliding panel or flipping picture that can make the objects appear and move away

would be appropriate for modeling or for eliciting constructions built around the pivot word "gone" like in "bus gone" "car gone", "baby gone", and so on).

- Reinforce each two-word construction produced by the child with a smile and/or a touch and the word "good" or something of the kind, then move to intermittent reinforcement like one reinforcement for every two or three multiword utterances.
- When two-word utterances become more frequent, proceed to model three-word utterances and to expand the spontaneous two-word productions of the child into three-word utterances.

REFERENCE LIST

- BATESON, M., MOTHER-INFANT EXCHANGES:THE EPIGENESIS OF CONVERSATIONAL INTERACTION. IN D. AARON SON & R. RIEBER (EDS.), DEVELOPMENTAL PSYCHOLINGUISTIC AND COMMUNICATION DISORDERS. NEW YORK:THE NEW YORK ACADEMY OF SCIENCES, 1975, VOL. 263, PP. 101-113.
- BRICKER, D. IMITATIVE SIGN TRAINING AS FACILITATOR OF WORD-OBJECT ASSOCIATION WITH LOW-FUNCTIONING CHILDREN. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1972, 76, 509-516.
- BRICKER, W & BRICKER, D., DEVELOPMENT OF RECEPTIVE VOCABULARY IN SEVERELY RETARDED CHILDREN. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1971, 75, 599-605.
- BRUNET, J. ON PRELINGUISTIC PREREQUISITES OF SPEECH. UNIVERSITY OF EXFORD, DEPARTMENT OF EXPERIMENTAL PSYCHOLOGY, 1975.
- BUJUM, N. RYNDERS, J., & TURNURE, J. A SEMANTIC-RELATIONAL CONCEPTS BASED THEORY OF LANGUAGE ACQUISITION AS APPLIED TO DOWN'S SYNDROME CHILDREN:IMPLICATIONS FOR A LANGUAGE ENHANCEMENT PROGRAM. MINNEAPOLIS: UNIVERSITY OF MINNESOTA, RESEARCH AND DEVELOPMENT CENTER IN EDUCATION OF HANDICAPPED CHILDREN, 1974.
- DALE, P. SYNTACTIC DEVELOPMENT IN DOWN'S SYNDROME CHILDREN. PAPER PRESENTED TO THE SYMPOSIUM "LANGUAGE DEVELOPMENT IN DOWN'S SYNDROME CHILDREN" OF THE 85 TH MEETING OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION, SAN FRANCISCO, AUGUST 1977.
- EDWARDS, E. SENSORY-MOTOR INTELLIGENCE AND SEMANTIC RELATIONS IN EARLY CHILD GRAMMAR. COGNITION, 1973, 2, 395-434.
- EIMAS, P., SIQUELAND, E., JUSCZY K.P., & VIGORITO, J. SPEECH PERCEPTION IN INFANTS. SCIENCE, 1971, 171, 303-306
- HUNT, J. McV. THE CHALLENGE OF IN COMPETENCE AND POVERTY. URBANA, ILLINOIS:UNIVERSITY OF ILLINOIS PRESS, 1969.
- JEFFREE, D., WHELDALL, K. & MITTLER, P. FACILITATING TWO-WORD UTTERANCES IN TWO DOWN'S SYNDROME BOYS. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1973, 78, 117-122.

- JONES, D. MOTHER-CHILD COMMUNICATION WITH PRE-LINGUISTIC DOWN'S SYNDROME AND NORMAL INFANTS. IN H.R. SCHAEFFER (ED.) INFANT INTERACTION. NEW YORK:ACADEMIC PRESS, 1977, PP. 379-401.
- KAHN, J. RELATIONSHIP OF PIAGET'S SENSORIMOTOR PERIOD TO LANGUAGE ACQUISITION OF PROFOUNDLY RETARDED CHILDREN. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1975, 79, PP. 640-643.
- MACDONALD, J., BLOTT, J., GORDON, K., SPIEGEL, B., & HARTMAN, M. AN EXPERIMENTAL PARENT ASSISTED TREATMENT PROGRAM FOR PRE-SCHOOL LANGUAGE-DELAYED CHILDREN. JOURNAL OF SPEECH AND HEARING DISORDERS, 1974, 39, 395-415.
- MAHONEY, G. AN ETHOLOGICAL APPROACH TO DELAYED LANGUAGE ACQUISITION. AMERICAN JOURNAL OF MENTAL DEFICIENCY, 1975, 80, PP. 139-148.
- OLLER, D., WIEMAN, L., DOYLE, W., & ROSS, C. INFANT BABBLING AND SPEECH. JOURNAL OF CHILD LANGUAGE, 1976, 3, 1-11.
- PIAGET, J. THE CONSTRUCTION OF REALITY IN THE CHILD. NEW YORK: BASIC BOOKS, 1954.
- RONDAL, J.A. MATERNAL SPEECH TO NORMAL AND DOWN'S SYNDROME CHILDREN MATCHED FOR MEAN LENGTH OF UTTERANCE. WASHINGTON, D.C.:AMERICAN ASSOCIATION ON MENTAL DEFICIENCY, MONOGRAPH NO 3, 1978.
- RONDAL, J.A., & HOFFMEISTER, R. SIGN LANGUAGE AS AN ALTERNATIVE LANGUAGE SYSTEM FOR THE MENTALLY RETARDED. PHILIPPINE JOURNAL OF MENTAL HEALTH, 1976, 7, PP. 57-62.
- SCHAEFFER, E.S. NEED FOR EARLY AND CONTINUING EDUCATION. IN V. DENENBERG (ED.), EDUCATION OF THE INFANT AND YOUNG CHILD. NEW YORK:ACADEMIC PRESS, 1970.
- SMITH, B. PHONOLOGICAL DEVELOPMENT IN DOWN'S SYNDROME CHILDREN. PAPER PRESENTED AT THE SYMPOSIUM "LANGUAGE DEVELOPMENT IN DOWN'S SYNDROME CHILDREN" OF THE 85TH ANNUAL CONVENTION OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION, SAN FRANCISCO, AUGUST 1977.

WIEGERINK, R., HARRIS, C., SIMEONSSON, R., & PEARSON, M.

SOCIAL STIMULATION OF VOCALIZATIONS IN DELAYED INFANTS:
FAMILIAR AND NOVEL AGENT. CHILD DEVELOPMENT, 1974, 45,
pp. 866-872.

WILLBRAND, M.L., PSYCHOLINGUISTIC THEORY AND THERAPY FOR INITIA-
TING TWO WORD UTTERANCES. BRITISH JOURNAL OF COMMUNICATION
DISORDERS, 1977, 121, pp. 37-46.

YODER, P., & MILLER, J. WHAT WE MAY KNOW AND WHAT WE CAN DO:
INPUT TOWARD A SYSTEM. IN J. McLEAN, D. YODER, & R. SCHIEFEL-
BUSH (Eds.), LANGUAGE INTERVENTION WITH THE RETARDED:
DEVELOPPING STRATEGIES. BALTIMORE:UNIVERSITY PARK PRESS,
1972, pp. 89-107.

NOTES

1. PAPER PREPARED FOR THE SEMINAR ON "LINGUISTIC DEVELOPMENT IN SEVERELY AND MODERATELY RETARDED CHILDREN" OF THE FIRST WORLD CONGRESS ON FUTURE SPECIAL EDUCATION, THE COUNCIL FOR EXCEPTIONAL CHILDREN, THE UNIVERSITY OF STIRLING, STIRLING, SCOTLAND, JUNE 1978.
2. ASSOCIATE PROFESSOR OF EDUCATION, OFFICE 1326, FACULTY OF EDUCATION, LAVAL UNIVERSITY, QUEBEC, P.Q., CANADA G1K 7P4